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MUSEUM METHODS

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It should be understood to begin with that we are dealing with methods applicable to a zoological museum connected with a collegiate institution, a problem different in several important particulars from that of a municipal or state museum in that the primary function of a college museum is to serve students, rather than the general public. Systematic collections, for instance, are relatively more important in a college museum than elsewhere; and entertainment, in itself, it not of supreme importance although we can by no means neglect it entirely.

Let us first consider some of the general considerations that go far to make or mar any museum whatever, and none of these is more vital than the problem of *lighting*.

When conditions permit, a combination of sky-lights and high side-lights seems to me to be the best possible solution. In "Mammal Hall" and "Bird Hall" which occupy the greater part of the third story of our building,¹ this plan has proved quite satisfactory. Incidentally it is economical of wall space, as all of the side walls can be occupied by exhibit cases up to a height of eight feet. The light coming, as it does, from above this height is most like that out of doors as to *direction*, and most of the reflections, so distressing to the museum man as well as to the visitors, are avoided. In some cases, where a uniform light is required and special effects desired, the illumination should be entirely by electric light which gives much more uniform effect than can possibly be secured by the use of natural light. We have adopted this plan in our "Laysan Exhibit" which is in the form of a cyclorama. Another valuable feature of this method is the fact that we can thus

¹Hall of Natural Science, State University of Iowa. The writer has been requested to discuss some of the methods used in the zoological museum of which he has been curator for the past thirty years. Hence he feels free to refer to this museum as furnishing illustrations of the points which he desires to make in this paper.

avoid almost entirely the bleaching effect on valuable specimens that seems to be a natural concomitant of strong daylight.

If neither of the methods of lighting mentioned above is available, the next best thing seems to be the well known "alcove system" so largely used in most museums.

The next general consideration, and one greatly neglected in many museums, is the matter of a general color scheme for a background for our exhibition series. We believe that this has been solved in a very satisfactory way in our exhibits of mammals and birds by a uniform background of dull light olive in all of the cases for the systematic series, including the shelves. This color is very restful to the eye, forms a sufficient, but not too glaring, contrast with a vast majority of the specimens exhibited, and is, in fact, a sort of impressionist effect most like that of out-of-doors, with its green fields and forests, the commonest color in most landscapes. It is the one the eye is most used to and therefore remarkably restful and satisfactory.

For invertebrate exhibits the problem is quite different. I suppose no class of objects has been more nearly the despair of curators than the alcoholic collections, or those which have to be preserved in fluids. With us all such material is in cases built on the alcove plan with a side light from large windows. The object here is to make each individual specimen stand out clearly and without distortion. We use square museum jars, of course. The general background is a dull black, but each object has its own background to suit its general color. These individual backgrounds gave us a lot of trouble. The glass plates that are sold by dealers to put in the jars are expensive and it is difficult to attach the specimens to them. I have seen slate slabs used for this purpose, but these are nearly as troublesome as glass. Finally we hit upon the idea of plaster of paris plates which are made quickly and very cheaply by pouring the thin plaster on a large sheet of plate glass and cutting it in the desired sizes before hardening. These cost almost nothing, are practically indestructible, can easily be bored with holes for the attachment of specimens and have a beautiful white surface against which colored specimens stand out in a very satisfactory way.

But light colored specimens must have a darker background, and we tried several methods of painting or staining these plaster plates. Few paints or stains are unaffected by alcohol, formalin and glycerin preservatives; and we were fairly stumped until we tried Higgins' indelible inks put on with a brush, which worked beautifully. We can now have backgrounds to suit ourselves for this very vexatious department of the museum.

Another important point in museum exhibits is to avoid overcrowding. A number of objects, individually interesting and instructive, placed in close proximity is most confusing to the visitor and forms an important contributory cause of "museum fatigue."

We find that the best results are obtained by placing the square jars some distance apart and mounting each specimen carefully as a distinct entity, with nothing else sufficiently near to distract the attention of the observer. Each jar has a label glued to its face where it will not obstruct inspection of the specimen, and each label is covered with a glass slip, a little larger than the label, securely cemented to the jar. In other words, the label is practically a part of the jar, can not be soiled nor easily displaced and is nearly indestructible, and each specimen is a separate focus of attention.

"Museum fatigue" has been ably discussed by Benjamin Ives Gilman in the *SCIENTIFIC MONTHLY*, 2, p. 62. Having this in mind, we avoid table cases over which the visitor must bend, and use, so far as possible, upright cases before which he stands erect. We also attempt to so place specimens as to be within eighteen inches of the level of the average eye. While this can not be entirely carried out on account of enforced economy of space, it is possible to place nearly all objects of real interest to the ordinary visitor in a horizontal band of three feet, leaving less interesting or attractive objects to fill the space above and below this band.

Having considered the general questions of proper lighting, backgrounds, spacing and avoidance of museum fatigue, we come to a subject of grave concern to the curator in charge of the educational museum and that is the question of systematic series versus habitat groups.

If the taxidermist, or "preparator," as I believe he prefers to be called, is an up-to-date man and a real artist he will throw all

of his influence in the direction of preparing the beautiful modern habitat groups that are so justly admired by the public and so well adapted to showing the artist's ability and skill. And no one can blame him for this, as it is the necessary expression of his creative instinct. He has an actual horror of rows of birds on "T" perches, arranged in solemn ranks and about as inspiring as the tin soldiers of our infancy. Were the object of the museum simply to please and entertain, his position would be unassailable. I contend, however, that the student of birds, for instance, should first of all be able to identify at sight as many of the avian inhabitants of his region as possible. Habitat groups, beautiful and true to nature as they sometimes (not usually) are, are necessarily too limited in number and require too great an expenditure of time, money and space to meet this primary educational need. On this account I would have only so many habitat groups as can be prepared and installed *without sacrificing the systematic series*, whose great educational function, it seems to me, justifies its retention in spite of the opposition of the modern taxidermist, with whose point of view we can still have a very real sympathy.

Some well prepared groups should, however, be in every zoological museum. By this I do not mean the hap-hazard throwing together of specimens and accessories that is such a painful feature in too many museums; but real *pictures*, correct and satisfying from both the scientific and artistic points of view, such as are now seen in most of our great museums and some of the smaller ones.

A compromise between the systematic series on "T" perches and the habitat group idea has been attempted in some museums and has attained a certain vogue. I refer to imitation or natural branches, tree trunks, etc., with leaves and other accessories, each with its bird or pair of birds with perhaps a nest, all fastened to the common background of the case. Like most compromises this arrangement is unsatisfactory, to me at least. It is "neither fish, flesh nor good red herring." The result is a sort of patch-work resembling the crazy quilt of our youth. The specimens are usually crowded together to economize space, and even if the separate pieces are well done there is a painful sense of confusion as the eye tries to take in too many details at once. On the other hand, the pri-

mary object of the systematic series is lost because the specimens can not easily be handled nor removed from their cases.

In the Hancock Museum on Newcastle-on-Tyne is the best exhibit that I have seen along this line. It consists of walls completely occupied by small box cases of uniform or interchangeable sizes, each with a pair of birds with well chosen accessories and a separate painted background. I do not think, however, that even this is as available for a college museum as the old-fashioned series on uniform perches, with no attempt whatever at accessories, but interspersed here and there with a few really good and well chosen habitat groups.

The question of securing material for our exhibit might well have been discussed earlier; but the general considerations already touched upon should, in my opinion, be settled before the collections are secured. How a museum should *not* be built up is sadly illustrated by a majority of American institutions. These are the result of gradual accretion of well-meant but disastrous donations of specimens and collections from amateur collectors and "taxidermists" who have acquired a heterogeneous lot of material of which they have become tired and whose room is better than its company.

Individually and collectively such aggregations are usually of little value to an up-to-date museum. The taxidermy is ordinarily atrocious and the data deficient or wanting. Often they are regarded with egregious pride by their donor or his heirs.

To decline such collections is apt to land the curator in high disfavor with people who, after all, believe that they are doing a highly laudable thing. Nowhere else is a superior diplomacy more necessary than here, where the conscientious museum man is called upon to avoid serious offense to friendly people on the one hand and disaster to his exhibit on the other.

The best, and ordinarily the only, satisfactory way to secure material is to go after it yourself, or send thoroughly competent men. These men should not only be naturalists, but highly trained collectors. As a general thing the man who is eventually to mount or otherwise put the collection on exhibit should have as free a rein as possible. If habitat groups are contemplated a competent artist should go along to prepare sketches and details for the background.

If he and the taxidermist can properly "hit it off" together, the best results will be attained.

Perhaps I may be permitted to refer once more to our Laysan Island exhibit, the most ambitious and satisfactory thing that we have attempted. After the expedition was organized, and financed through donations from students and friends, it was placed absolutely in the hands of Professor Homer R. Dill who finally prepared the exhibit. We were also most fortunate in securing the services of Mr. Charles A. Corwin, whose backgrounds in the Field Columbian Museum have been so unusually beautiful and satisfying, as a member of the party. An assistant taxidermist and general utility man were added. The amount of work done and material secured by this party of four men in the short time that they were permitted to remain on the Island was astonishing. Accessory material, such as bushes, samples of coral rock, leaves, grasses, entire nests of many species, an ample series of sketches in oil by the artist, hundreds of photographs and a collection of bird skins most beautifully prepared in spite of the haste and pressure under which the work was accomplished; all these were secured, packed and transported to their destination without appreciable damage.

Then the masterly work of Professor Dill could be built upon a proper foundation of field observation, and the hearty and efficient co-operation of Mr. Corwin in painting his beautiful background representing the wind-swept mid-Pacific Island with its surrounding reefs and Ocean has resulted in a piece of work that is a delight from the standpoint of both naturalist and artist. This background is 12'x138', forming a cyclorama in which the background and foreground is joined with consummate skill through the combined artistry of these two men.

The modern museum must have a taxidermist (or preparator, if you will) not only up to date in the technic of the art, an artist not only in skill but in feeling; but he should be a man able to advance the work by original ideas. In our museum that man is Professor Dill. He has prepared, for instance, several mammal groups that differ in conception from previous work. Such are the Mountain Lion group in which the observer is *inside* the den, looking out of the rugged entrance upon an alpine scene of quiet beauty illum-

inated by concealed electric lights ; and a "flash-light" picture of Virginia Deer by a quiet woodland pool on a frosty night.

Apparently trivial details will often determine the success or failure of a group. Snow and water must not look like frosting on cake or glass or glue. An effective composition to fill out and sustain the ears of large mammals must be light and hard, but not brittle. One of the most difficult classes of objects to make pleasing and natural is mounted fish and particularly their fins. The degreasing of old and more or less "burnt" skins without injury has long been a problem. These difficulties, and others, have been successfully surmounted in our case by Professor Dill who will, we hope, some day give to the world the details of his methods.

Many points, such as the importance of securing and properly storing the reserve or study series, the whole matter of satisfactory labeling, the question of steel versus wooden cases, the proper exhibition of small objects such as mollusks and of microscopic forms such as Foraminifera, label holders, museum records, etc., must be left untouched ; for this article has already claimed too much space.